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Lance A. Termes
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1026

EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/919,687	SCHUSTER ET AL.	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *32-39* is/are allowed.

6)☒ Claim(s) *1-4,6-14,16,20-24,26-28,30,31,40-48,50 and 51* is/are rejected.

7)☒ Claim(s) *5,15,17-19,25,29 and 49* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20020916*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 7-14, 20-24, 26-28, 30, 31, 40, 41, 43-48, 50 and 51 are rejected under 35 U.S.C. 102(e) as being anticipated by Chan et al. (US Patent No. 6504634).

Regarding claim 1, Chan et al. disclose a method, comprising: generating a communication signal, transmitting the communication signal in a free-space optical communication system along an optical signal path from a first free-space optical terminal to a second free-space optical terminal, the second free-space optical terminal including a receiver to receive an optical signal (fig. 1 and col. 1, line 58 to col. 2, line 11); sensing a weather condition in proximity to the optical signal path (col. 32, lines 26-32 and col. 33, lines 35-39); sending at least one engage signal to a system component to implement a tracking mode in response to the sensed weather condition and altering the communication signal in response to the at least one engage signal (col. 32, lines 40-42 and line 59 to col. 33, line 6).

Regarding claim 2, Chan et al. disclose the method of claim 1, wherein the communication signal comprises a high-frequency data signal with a low-frequency tracking tone superimposed thereon (col. 30, line 64 to col. 31, line 8), the low-frequency tracking tone having an amplitude, and wherein altering the communication signal comprises increasing the

amplitude of the low-frequency tracking tone (col. 31, lines 5-8 and col. 32, line 59 to col. 33, line 9).

Regarding claim 3, Chan et al. disclose the method of claim 1, wherein altering the communication signal comprises replacing the communication signal with high-power pulses at a low-duty cycle (col. 31, lines 29-60).

Regarding claim 4, Chan et al. disclose the method of claim 1, further comprising: altering a configuration of a receiver component in response to the at least one engage signal (col. 33, lines 26-37 and lines 49-56).

Regarding claim 7, Chan et al. disclose the method of claim 1, wherein sensing the weather condition comprises identifying a reduction in signal strength, at the receiver, below a pre-defined threshold (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 8, Chan et al. disclose the method of claim 1, wherein sensing the weather condition comprises measuring at least one physical characteristic associated with the weather condition (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 9, Chan et al. disclose a method, comprising: generating a tracking signal (col. 32, line 59 to col. 33, line 9); transmitting the tracking signal in a free-space optical communication system along an optical signal path from a first free-space optical terminal to a second free-space optical terminal, the second free-space optical terminal including a receiver to receive an optical signal (fig. 1 and col. 1, line 58 to col. 2, line 11); sensing a weather condition in proximity to the optical signal path (col. 32, lines 26-33); sending at least one engage signal to a system component to implement a tracking mode in response to the sensed weather condition, and altering the tracking signal in response to the at least one engage signal (col. 32, lines 40-42 and line 59 to col. 33, line 6).

Regarding claim 10, Chan et al. disclose the method of claim 9, further comprising: altering a configuration of a receiver component in response to the at least one engage signal (col. 33, lines 26-37 and lines 49-56).

Regarding claim 11, Chan et al disclose a free-space optical communication system, comprising: a first free-space optical terminal coupled to communication electronics to generate a communication signal, the first free-space optical terminal including a transmitter configured to transmit an optical signal (fig. 1 and col. 1, line 58 to col. 2, line 11); a second free-space optical terminal, including a receiver to receive the optical signal, the receiver being coupled to tracking electronics to process a tracking signal (col. 32, line 59 to col. 33, line 9); and a sensor to sense a weather condition in proximity to an optical signal path, the sensor coupled to the communication electronics (col. 32, lines 26-32 and col. 33, lines 35-39); and wherein in response to a weather condition sensed in proximity to the optical signal path, the sensor is configured to send a first engage signal to the communication electronics, and the communication electronics is configured to alter the communication signal in response to the first engage signal (col. 32, lines 40-42 and line 59 to col. 33, line 6).

Regarding claim 12, Chan et al. disclose the system of claim 11, wherein the communication signal comprises a high-frequency data signal with a low-frequency tracking tone superimposed thereon (col. 30, line 64 to col. 31, line 8), the low-frequency tracking tone having an amplitude, and wherein the communication electronics is configured to alter the communication signal by increasing the amplitude of the low-frequency tracking tone (col. 31, lines 5-8 and col. 32, line 59 to col. 33, line 9).

Regarding claim 13, Chan et al. disclose the system of claim 12, wherein the communication electronics are further configured to alter the communication signal by disabling

a high-frequency data modulation portion of the communication signal (col. 31, lines 29-60), where the disabling is interval disabling.

Regarding claim 14, Chan et al. disclose the system of claim 11, wherein the communication electronics is configured to alter the communication signal by replacing the communication signal with high-power pulses at a low-duty cycle (col. 31, lines 29-60).

Regarding claim 20, Chan et al. disclose the system of claim 11, wherein the sensor comprises a detector to receive at least a portion of the optical signal, the detector coupled to electronics configured to receive a detected signal from the detector and to compare the detected signal with a pre-defined threshold, and wherein sensing the weather condition comprises identifying a reduction in the detected signal below the pre-defined threshold (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 21, Chan et al. disclose the system of claim 11, wherein the sensor comprises an apparatus capable of measuring at least one physical characteristic associated with the weather condition, and wherein sensing the weather condition comprises measuring the at least one physical characteristic and identifying the weather condition therefrom (col. 31, lines 29-60).

Regarding claim 22, Chan et al. disclose a free-space optical terminal, comprising: a signal generator to generate a high-speed signal; a tone generator to generate a low-frequency tracking tone having an amplitude, the tone generator coupled to a controller, a first modulator circuit, coupled to the signal generator and the tone generator, to combine the high-speed signal with the low-frequency tracking tone to produce a product signal, a second modulator circuit, coupled to the first modulator circuit, to combine the product signal with the high-speed signal to produce a communication signal (col. 30, line 64 to col. 31, line 8); and a transmitter to transmit the communication signal as an optical signal to a second free-space optical terminal capable of

receiving the optical signal (fig. 1 and col. 1, line 58 to col. 2, line 11); and wherein the controller is coupled to a sensor configured to sense a weather condition, and to generate and send an engage signal to the controller in response to the sensed weather condition, and wherein the controller is configured to increase the amplitude of the low-frequency tracking tone in response to the engage signal (col. 31, lines 5-8 and col. 32, line 59 to col. 33, line 9).

Regarding claim 23, Chan et al. disclose the free-space optical terminal of claim 22, wherein the controller is further configured to disable a high-frequency data modulation portion of the communication signal in response to the engage signal (col. 31, lines 29-60), where the disabling is interval disabling.

Regarding claim 24, Chan et al. disclose the free-space optical terminal of claim 22, wherein the sensor is further configured to generate and send a disengage signal to the controller in response to an abatement of the weather condition, and the controller is further configured to decrease the amplitude of the low-frequency tracking tone in response to the disengage signal (col. 32, lines 18-23).

Regarding claim 26, Chan et al. disclose the free-space optical terminal of claim 22, wherein the sensor comprises a detector to receive at least a portion of the optical signal, the detector being coupled to electronics configured to receive a detected signal from the detector and to compare the detected signal with a pre-defined threshold, and wherein sensing the weather condition comprises identifying a reduction in the detected signal below the pre-defined threshold (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 27, Chan et al. disclose the free-space optical terminal of claim 22, wherein the sensor comprises an apparatus capable of measuring at least one physical characteristic associated with the weather condition, and wherein sensing the weather condition

comprises measuring the at least one physical characteristic and identifying the weather condition therefrom (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 28, Chan et al. disclose a free-space optical terminal, comprising: a signal generator to generate a data signal, the signal generator coupled to a controller; a light source, coupled to the signal generator, to produce an output from the data signal, an amplifier, coupled to the light source, to communicate the output to a transmitter to transmit the signal as an optical signal to a second free-space optical terminal configured to receive the optical signal (fig. 8, 9 and 11 and col. 9, lines 9-31, col. 10, lines 19-29 and col. 14, lines 30-50), where the driver is an amplifier coupled to the light source; and wherein the controller is coupled to a sensor configured to sense a weather condition, and to generate and send an engage signal to the controller in response to the sensed weather condition (col. 32, lines 26-33 and line 59 to col. 33, line 9), where the coupling is the transmitter coupled to the receiver via the communication channel from the receiver to the transmitter; and wherein the controller is configured to replace the data signal with high-power pulses at a low-duty cycle in response to the engage signal (col. 31, lines 29-60).

Regarding claim 30, Chan et al. disclose the free-space optical terminal of claim 28, wherein the sensor comprises a detector to receive at least a portion of the optical signal, the detector being coupled to electronics configured to receive a detected signal from the detector and to compare the detected signal with a pre-defined threshold, and wherein sensing the weather condition comprises identifying a reduction in the detected signal below the pre-defined threshold (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 31, Chan et al. disclose the free-space optical terminal of claim 28, wherein the sensor comprises an apparatus capable of measuring at least one physical characteristic associated with the weather condition, and wherein sensing the weather condition

comprises measuring the at least one physical characteristic and identifying the weather condition therefrom (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 40, Chan et al. disclose a method, comprising: generating a communication signal comprising a data signal with a tracking tone superimposed thereon, the tracking tone having an amplitude, transmitting the communication signal in a free-space optical communication system along an optical signal path from a first free-space optical terminal to a second free-space optical terminal, the second free-space optical terminal including a receiver to receive an optical signal (fig. 1 and col. 1, line 58 to col. 2, line 11 and col. 30, line 64 to col. 31, line 8); monitoring a characteristic of the communication signal (col. 32, lines 26-32 and col. 33, lines 35-39); sending at least one engage signal to a system component to implement a tracking mode in response to the monitored characteristic; and altering the communication signal by increasing the amplitude of the tracking tone in response to the at least one engage signal (col. 32, lines 40-42 and line 59 to col. 33, line 6).

Regarding claim 41, Chan et al. disclose the method of claim 40, further comprising altering a configuration of a receiver component in response to the at least one engage signal (col. 32, lines 40-42 and line 59 to col. 33, line 6).

Regarding claim 43, Chan et al. disclose the method of claim 40 wherein monitoring a characteristic of the communication signal comprises identifying a reduction in signal strength, at the receiver, below a pre-determined threshold (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 44, Chan et al. disclose a free-space optical communication system, comprising: a first free-space optical terminal coupled to communication electronics to generate a communication signal, the first free-space optical terminal including a transmitter configured to transmit the communication signal as an optical signal, a second free-space optical terminal, including a receiver to receive the optical signal (fig. 1 and col. 1, line 58 to col. 2, line 11), the

receiver being coupled to tracking electronics to process a tracking signal, and a sensor to sense changes in the optical signal, the sensor coupled to the communication electronics; and wherein in response to changes in the optical signal, the sensor is configured to send a first engage signal to the communication electronics, and the communication electronics is configured to alter the communication signal in response to the first engage signal (col. 32, lines 40-42 and line 59 to col. 33, line 6).

Regarding claim 45, Chan et al. disclose the system of claim 44 wherein the communication signal comprises a data signal with a tracking tone superimposed thereon, the tracking tone having an amplitude, and wherein the communication electronics is configured to alter the communication signal by increasing the amplitude of the tracking tone (col. 32, lines 40-42 and line 59 to col. 33, line 6).

Regarding claim 46, Chan et al. disclose the system of claim 44 wherein the sensor comprises a detector to receive at least a portion of the optical signal, the detector coupled to electronics configured to receive a detected signal from the detector and to compare the detected signal with a pre-defined threshold, and wherein sensing changes in the optical signal comprises identifying a reduction in the detected signal below the pre-defined threshold (col. 32, lines 26-32 and col. 33, lines 35-39).

Regarding claim 47, Chan et al. disclose a free-space optical terminal, comprising: a signal generator to generate a high-speed signal; a tone generator to generate a tracking tone having an amplitude, the tone generator coupled to a controller; a first modulator circuit coupled to the signal generator and the tone generator, to combine the high-speed signal with the tracking tone to produce a product signal; a second modulator circuit, coupled to the first modulator circuit, to combine the product signal with the high-speed signal to produce a communication signal (col. 30, line 64 to col. 31, line 8); and a transmitter to transmit the

communication signal as an optical signal to a second free-space optical terminal capable of receiving the optical signal (fig. 1 and col. 1, line 58 to col. 2, line 11); and wherein the controller is coupled to a sensor configured to sense changes in the optical signal and to generate and send an engage signal to the controller in response to an adverse change in the optical signal, wherein the controller is configured to increase the amplitude of the tracking tone in response to the engage signal (col. 31, lines 5-8 and col. 32, line 59 to col. 33, line 9).

Regarding claim 48, Chan et al. disclose the free-space optical terminal of claim 47 wherein the controller is further configured to disable a high-frequency data modulation portion of the communication signal in response to the engage signal (col. 31, lines 29-60), where the disabling is interval disabling.

Regarding claim 50, Chan et al. disclose the free-space optical terminal of claim 47 wherein the sensor is further configured to generate and send a disengage signal to the controller in response to an abatement of the adverse change, and the controller is further configured to decrease the amplitude of the tracking tone in response to the disengage signal (col. 32, lines 18-23).

Regarding claim 51, Chan et al. disclose the free-space optical terminal of claim 47 wherein the sensor comprises a detector to receive at least a portion of the optical signal, the detector being coupled to electronics configured to receive a detected signal from the detector and to compare the detected signal with a pre-defined threshold, and wherein sensing the adverse change comprises identifying a reduction in the detected signal below the pre-defined threshold (col. 32, lines 26-32 and col. 33, lines 35-39).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6, 16 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al. (US Patent No. 6504634) in view of Degura (US Patent No. 5684614).

Regarding claims 6, 16 and 42, Chan et al. disclose the system and method of claims 1, 11 and 41, respectively, and disclose that the tracking signal is a low frequency signal, but do not disclose that the tracking signal is a narrow band signal. Degura disclose a free space optical communication system using a pilot tracking signal where the pilot signal is taught to be a narrower band signal than the main signal to that the control function of the pilot signal can be maintained even if the main signal becomes weak due to weather (col. 1, lines 41-45 and lines 51-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a narrow band tracking signal in the system of Chan et al. in order to provide the benefit of keeping alive the control channel if the main signal degrades due to weather, as taught by Degura.

Allowable Subject Matter

5. Claims 32-39 are allowed.

6. Claims 5, 15, 17-19, 25, 29, and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- US Patent No. 6031648 – discloses a free space optical communication system where the receiver splits the received optical signal to detect a pilot signal separate from the main communication signal (col. 1, lines 50-67 and col. 2, line 49 to col. 3, line 4).
- US Patent No. 3875400 – discloses the advantages of low frequency optical transmission for passing through bad weather conditions better than high frequencies (col. 3, line 50 to col. 4, line 24).

8. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

Hanh Phan
Primary Examiner
11/26/04